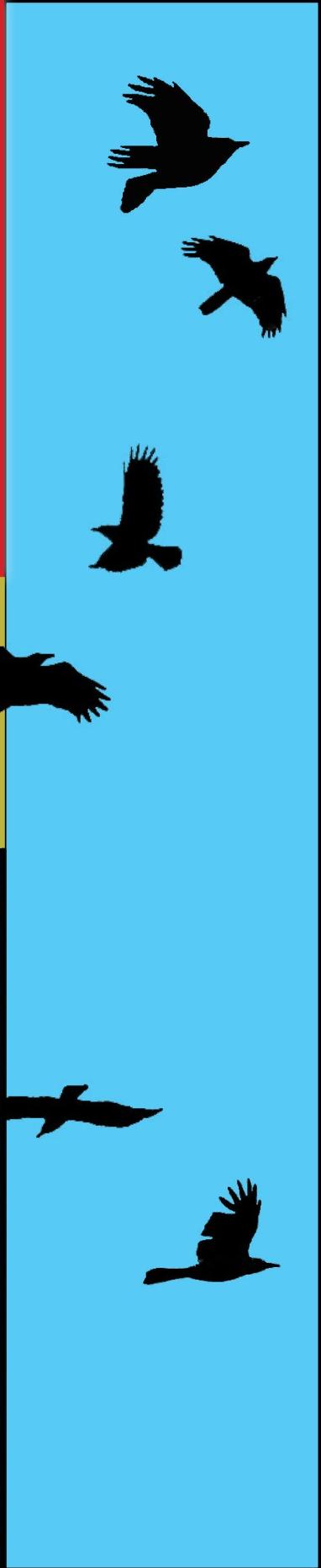


The AMERICAN CROW, NATURALLY

An illustrated ebook by

Tom Reaume

August 2013





Assiniboine Park – water, trees and lawn attract people and American Crows

The American Crow, Naturally

An illustrated ebook published by

Tom Reaume

August, 2013



Copyright © 2013 by Tom Reaume

Reaume, Tom, 1944– (Canadian)
The American Crow, Naturally

Research, design, layout, writing, proofing,
editing and images (unless indicated otherwise)
by Mr Tom Reaume.

Includes references and an index. **ISBN 978-0-9680082-3-2**

The complete 715-page, illustrated ebook (16 PDFs)
may be printed for **FREE**

Font – Arial 9.5 / 13 / 30

Created using InDesign and Photoshop Elements by Tom Reaume

Retired, I received no money for the creation of this self-published ebook.
It was a 10-year project. I will accept donations towards my well-being.



Upside down cloud



Contents



PREFACE 7

ACKNOWLEDGMENTS 8

INTRODUCTION 9

ART 10

Paintings, sculpture 10, Movies and music 12, Literature and folklore 13

TAXONOMY AND RANGE 15

Canadian range 15, Range 18, *Cb hesperis* 20, The Northwestern Crow 20, DNA barcode 22, Great Basin and vicinity 24, Utah 25, New Mexico 26, Nevada 26, Death Valley 27, Arizona 27, New York City 29, Elsewhere 29, *Corvus unicolor* rediscovered 30

THE STAGE 31

COLOR 32

Why black 33, Albinism 36

THE BREEDING SEASON 40

Ceremonial gatherings 40, Cooperative breeding 41, Two fashionable theories 42, Learning to help 42, Helpers 43, Courting calls and other sexual traits 51, Allopreening 53, Copulation 55, Sperm 56, Extrapair copulations 56, The nest 59, Nesting habitat and elevation 60, Nest location, etc 61, My Winnipeg study (2008 & 2009) 66, Nesting territory 68, Living with crows 74, Nesting in cities 83, Nest building 84, Nest architecture 86, Nest building trips 87, Renesting 92, False nests 92, Crows' nests used by other birds 94,

Eggs 97, Egg dates 99, Clutch size 100, Size of eggs 102, Weight of eggs 103, Content of eggs 103, Volume of eggs 104, Color of eggs 105, Nest defence 108, Incubation 109, Nestlings 113, Nestling dates 117, A nestling and its feathers 117, Thermoregulation 123, Global warming 125, Nestling's body development 126, Nestlings' activities 131, Feeding trips to the nest 137, Nest cleaning 140, Fecal sacs 140, Breeding success 141, Fledging dates 152, Dispersal 157

VOICE 159

What we hear 159, Anatomy 160, Their language 163, Structured and unstructured calling 164, Assembly / mobbing calls 164, Alarm / dispersal calls 166, 3 and counting 166, 23 types of calls 169, Location of some calls 170, Practice calls 176, Vocal experiments 178, North American calls 178, American and European calls 179, Dawn chorus 180

POPULATION CHARACTERISTICS 183

Plumage 183, Ageing crows 183, Molting 185, American Crow nestling's plumage 187, Juvenile plumage 188, Yearling plumage 189, Adult plumage 190, Observations on molting and color 191, Feathers 191, Eyes, bill, and feet 192, Mouth color and ageing 192, Bursa of Fabricius 193, Two age classes 193, Sexing crows 194, Weight 194, Measurements 196, Georgia and South Carolina 198, Saskatchewan 198, Kentucky 198, Quebec 198, Common Ravens in Wyoming 199, Sex ratio 200, Diseases 200, West Nile Virus 206, West Nile fever 206, American Crows 208, Sentinel species 215, American Crow or Northern Cardinal? 215, Year-round transmission of WNV 220, WNV detection 222, Mosquito vectors 228, A mosquito bite 229, *Culex tarsalis* 230, Feeding by mosquitoes 231, Bird surveys 236, Predators 238, Hawks and





owls 238, Eagles 243, Mobbing 244, Mammals 248, Injuries 248, Wind turbines 253, Television towers 254, Window strikes 255, Rates of dying and surviving 256, Parasites 256, Parasites in nests 258, *Protocalliphora* (a blowfly) 258, Ectoparasites 260, Fleas 260, Lice, mites, and ticks 260, Endoparasites (mostly) 262, Filarioid nematodes 265, Nematodes 269, *Splendidofilaria flexivaginalis* 270, *Diplostriaena tricuspidata* 272, Cestodes 273, Trematodes 274, Blood parasites 275, Experimental infection in the crow 277, Problems with methodology 278, Parasites in avian blood 280, *Isospora brachyrhynchi* 286, The Hawaiian Crow 288

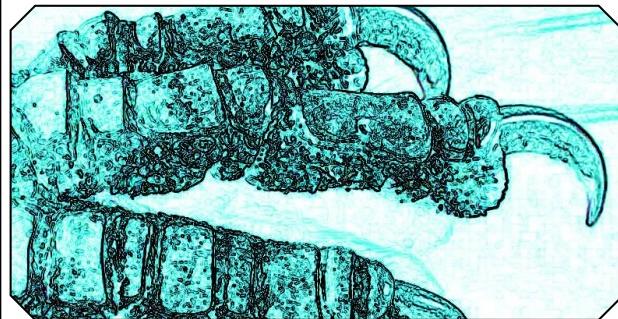
MIGRATION AND BANDING 297

Flying 297, Speed and distance 298, Spring arrivals 299, Canada 300, United States 301, Autumnal departures 302, Canada 302, United States 304, Other passerines (nocturnal) 305, Banding 305, Band recoveries 307, Hunting seasons survived 315, Longevity 315

FEEDING HABITS 316

American studies 316, Crops, crows, and insects 317, Crows in Kansas 327, Protection for orchards and crops 328, Methiocarb 331, Canadian studies 332, Crops and crows in Nova Scotia 332, Crops & crows in southern Ontario 332, Stable isotopes 336, British studies 337, The corn laws 338, Regurgitated pellets 341, Grit in pellets 344, Birds are worth it 348, Crows in Florida 348, The bill as a tool for feeding 349, Smaller feeding episodes 349, Miscellaneous foods 354, Crows or grackles? 357, Mammals as food 361, Birds 366, Predation on nesting colonies 367, Predation on common birds 373, Scolding predators 377, Mobbing studies 377, Predation on endangered birds 380, Studies using artificial songbird nests 380, Studies

with cameras at nests 383, Egg preferences by predators 385, Northwestern Crows 387, Fishing by American Crows 389, Cracking nuts 391, Discarded human food 393, Domestic cats 395, Waterfowl and crows 397, How bad are the crows? 399, Habitat improvement 400, A host of predators 403, Researchers at ducks' nests 404, Small mammals are players 406, Markers at nests 407, Studies using artificial ducks' nests 407, Nests close to roads 409, Some conclusions 409, My conclusion 411, Upland game birds 411, Artificial nests & some cameras 411, Predator removal doesn't work 413, Style and techniques 414, Sentinel crows 414, Feeding methods 416, Northwestern Crow's foraging technique 419, Road kills are food 420, DRC-1339 424, Food storage 424, How storage is done 426, Signposts 429, Food storage in Guelph, Ontario 431, Food storage in Winnipeg 432, Food storage by Northwestern Crows 434



POPULATION SURVEYS 440

Scale and spacial synchrony 440, Crow surveys 440, Problems with bird surveys 440, Crows near Guelph, Ontario 442, Other Canadian surveys 446, American surveys 449, The bigger picture 459, CBC and BBS 459

ANATOMY 465

Skeleton 466, Skull 466, Lower jaw 471, Jaws 471, The pectoral girdle 475, Wing bones 477, Humerus 477, Ulna and radius





480, Pelvic girdle **480**, Leg bones **481**, Toes **482**, Ribs and vertebrae **483**, Archaeological digs **486**, Muscles **487**, Flight & leg muscles **490**, Feathers **490**, Growth bars **490**, Fault bars **502**, Glands, ears, eyes, etc **503**, Uropygial gland **503**, Adrenal gland **509**, Anal glands **510**, The ear **510**, Sclerotic ring **510**, The eye **511**, Pecten oculi **512**, Gizzard **513**, Heart **513**

BEHAVIOR AND INTELLIGENCE 516

Preening and bathing **516**, Bill wiping **518**, Anting and sunbathing **518**, Playing **521**, A crow court **527**, Walking, perching, flying **528**, Walking **528**, Perching **530**, Flying **531**, Aggression **533**, Intelligence **534**, New Caledonian Crow **537**

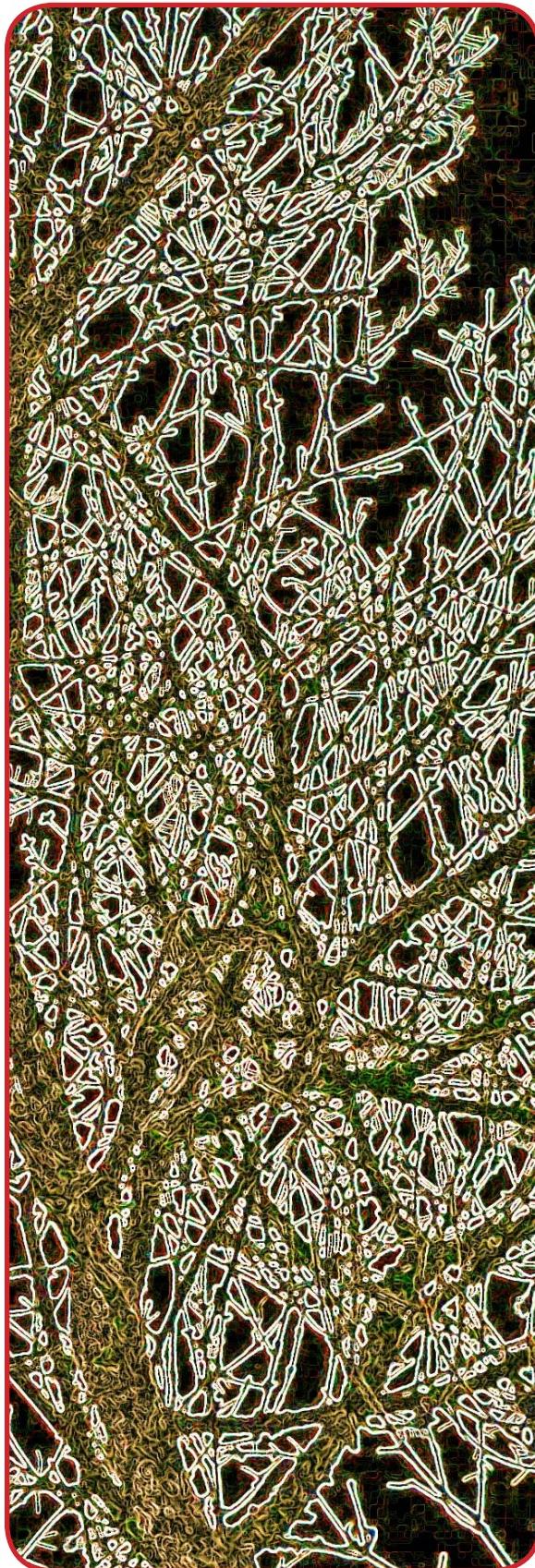
ROOSTING 542

Historical roosts **543**, United States **543**, Modern roosts **550**, United States **550**, Counting crows at roosts **556**, Canada **558**, The Essex roost **558**, The Chatham roost **560**, The Woodstock roost **561**, The Hamilton roost **561**, The St Catharines roost **562**, Elsewhere **563**, Two banding studies in New Jersey **563**, Christmas Bird Counts (Canada) **567**, Why do crows roost? **569**, Thermal **570**, Predators **574**, Information **574**, Family groups at roosts **579**, Flyways and assemblies **580**, Morning madness **593**, Inside the roost **597**, Soil at the roost **600**, Sleep **601**, Ways of controlling roosting crows **603**, Success in Japan **607**, Danger at the roost **611**

ANTHOLOGY OF QUOTATIONS 616

REFERENCES 619

INDEX 693





DRAWINGS BY PAGE NUMBER

- 76. Two territories with daily activity
- 122. NW Crows' downy feather tracts
- 133. Schematic of 9 nest visits from crow cam
- 161. Syrinx, 2 aspects
- 162. Three schematics of syrinx
- 164–165.** Sonograms of crow's calls
- 194. American Crow, dead
- 234. A DNA double helix
- 263. Nasal mite, *Ptilonyssus corvi*
- 268. Nematode, *Splendidofilaria caperata*
- 271. Nematode, *Porrocaecum ensicaudatum*
- 272. Nematode, *Diplostriaena* species
- 273. Cestode, *Paruterina reynoldsi*
- 276–77.** Trematode, *Brachylecithum americanum*
- 283. Protozoan, 2 *Trypanosoma* species
- 285. *Haemoproteus danilewskii*, 7 stages
- 286. Oocyst of *Isospora brachyrhynchi*
- 290. Nematode, *Splendidofilaria flexivaginalis*
- 348. Crow outside the door
- 465. Crow skeleton standing
- 469. Crow skull, side view
- 471. Crow skull, side view, vector forces
- 472. Crow bill, side view, external forces
- 473. X-sections through crow's upper bill
- 474. X-section lengthways of crow's upper bill
- 478. Large end of crow's humerus, labeled
- 491. Furcula, muscle attachments
- 491. Sternum, muscle attachments
- 492. Humerus, muscle attachments
- 493. Humerus of Jackdaw, head labeled
- 494–95.** Crow's wing muscles
- 496. Pectoral girdle, muscle attachments
- 497–500.** Crow's leg and toe muscles
- 511. Sclerotic ring of Western Scrub-jay
- 512. X-section of bird's eye, general
- 538. Brain of New Caledonian Crow

GRAPHS BY PAGE NUMBER

- 98. Clutch starting dates near Saskatoon
- 105. Hooded Crow, volume of last egg
- 107. Time spent brooding by female crows
- 108. Weight changes in nestlings over 30 days
- 130. Tarsal and head lengths
- 169. Juvenile calls by sex
- 171. 5 calls by family members
- 172. 5 calls by adult breeders and helpers
- 173. 5 calls by adult males and females
- 199. Wing chord and head-bill lengths
- 204.** DNA fingerprinting; 10 bird species
- 212. WNV reservoirs of 5 bird species
- 232. Electrophoresis of 11 bird's DNA
- 267. Filarial infection in crows from Georgia
- 298. Weigh and energy costs of flight
- 313. Number of hunting seasons survived
- 374. Urban food of crows in Seattle

- 392. Drops of walnuts by crows
- 444.** # of crows / mo. near Guelph, ON
- 445. Ave # crows and sightings per day, ON
- 445. Ave. # crows per sighting, ON
- 449.** # of crows / month by a roost in Tennessee
- 452. CBC, 40 years at Boise, Idaho
- 454. Best time of day to detect corvids
- 459. CBC in Kansas over 50 years
- 460. BBS of crows in N America, 1970–2010
- 460. CBC of crows in N America, 1970–2010
- 463. CBC for Manitoba, 50 years
- 463. CBC for Ontario, 50 years
- 470. 6 corvids separated by skull landmarks
- 536. Telencephalic areas of 17 taxa
- 537. 4 parts of avian brain for 6 species
- 573. Roost demise from Jan–March, Ohio
- 588. Timing of magpies leaving a roost

MAPS BY PAGE NUMBER

- 16. Range of the American Crow
- 24. Great Basin
- 43. BBS map post arrival of WNV, 2006–2010
- 76. Two territories with daily activity
- 81. 4 nest study sites in Guelph, Ontario
- 91. Nest material gathering pattern
- 309. Banding locations in Canada over 40 years
- 311. Recoveries of crows banded in Saskatchewan
- 312. Migration pattern, western N. America
- 313. Migration pattern, eastern N. America
- 433. Food storage experiment in Winnipeg
- 442–43.** Roadside census near Guelph, Ontario
- 548. Maps of winter roosts in Illinois and Ohio
- 550. Maps of large urban roost, eastern N. Amer.
- 551–52.** Crow roost location in Hamilton, Ontario
- 557. Winter roosts of crows in California
- 559. Location of 5 roosts in southern Ontario
- 561–62.** Locations of roosts at Essex, Ontario
- 563–64.** Location of roost in Chatham, Ontario
- 565. Location of roost in Woodstock, Ontario
- 584–85.** Evening flyways at Essex, Ontario

TABLES BY PAGE NUMBER

- 21. Taxonomic measurements
- 63. ON & OH tree species used for nesting
- 75. 7 days of living with a family of crows
- 98. Nest density of crows near Saskatoon
- 124. Downy feather lengths and counts
- 167–68.** Number of caws per bout
- 168. 3 corvids; auditory differences
- 291–96.** Some parasites of the American Crow
- 308. Recoveries of banded crows in N America
- 310. Recoveries of banded crows in USA
- 332. Crows / sightings in southern Ontario
- 333. Habitat types in 3 Ontario counties
- 443. Habitat types during census near Guelph
- 586.** # of flyways at the Essex, Ontario roost
- 602. Shit and soil analysis at roosts in OK and ON





PREFACE

When we step outside our caves we enter their world. Although we build cities and towns as human sanctuaries to isolate ourselves from wild plants and animals, they are there for those of us who care to look. Birds especially are there. The roofs and edges of our sanctuaries are always open. Some birds join us, others shy away.

The American Crow is not one of the shy ones. The quintessential bird, it excites me like no other member of the avian community. With a color that glistens in sunlight like freshly ploughed earth, and a voice that shatters the clear dawn of a numbing winter's day, this bird has flown through my vision since childhood.

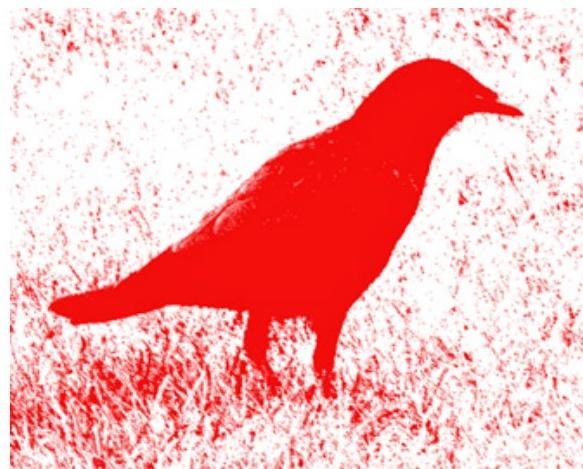
During my youthful wanderings about the fields of Essex County in southern **Ontario**, I had the time and inclination to absorb the forms and textures of wild plants and animals. In retrospect, these early wanderings were very important, although at the time the pleasure of each step was enough. And crows were always there. They nested in hedgerows in the summer and arrived mysteriously each morning from a wintery roost beyond my vision.

My outlook on the crow is a positive one. Instead of a *murder of crows*, I occasionally use a **courage of crows**. Crows should be admired for the courage they have shown in coping with their most mortal enemy. They have made a long journey, in spite of us.

Science plays an important role in the creation of this book, and in our culture, but it offers only one glimpse of the world. To obtain a more complete view of the crow, I included additional impressions from the arts. I would not have been faithful to myself, to the crow, or to my readers without a broad interpretation.

The crow is an unconventional bird and a book on it must reflect this. The visual images are new and old. I believe the Crow would be pleased with my interpretations of *its* world.

A walk on a snowy knoll along the edge of a pine grove is magnified by a courage of crows set against the receding depth of a clear blue sky. Their voice, color, and jazz linger long after they have disappeared beyond a distant woods. ■



Crows and clouds are above us





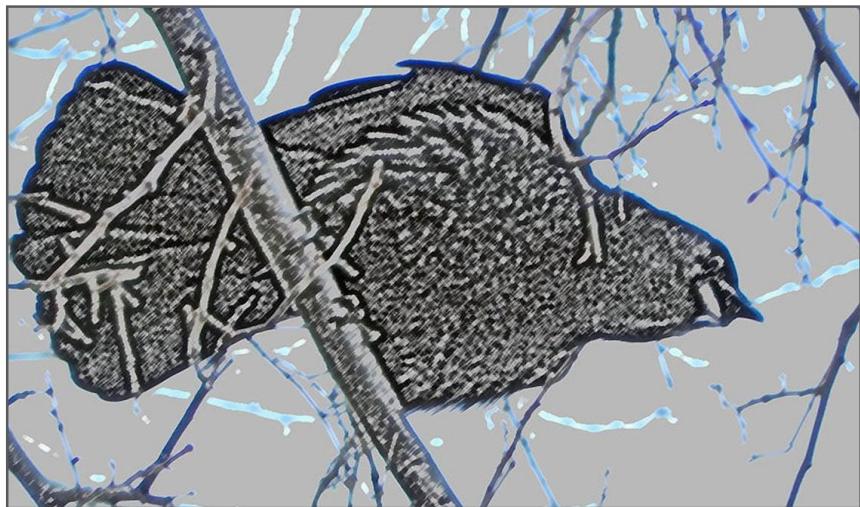
ACKNOWLEDGMENTS

Many individuals, on their own initiative and through organizations they were associated with, helped in numerous ways for which I am most thankful. In particular, staff at the Canadian Wildlife Service in Ottawa provided records on banded American Crows. Technicians at the Ontario Ministry of Agriculture and Food analyzed soil samples from the Essex crow roost. Special thanks to all map makers, without whom field work would be even more time consuming. People at the Royal Ontario Museum in Toronto provided access to nest-record cards and objects peculiar to the American Crow. Randy Mooi and Janis Klapke at the Manitoba Museum provided access to nest-cards and a crow's skeleton. Many thanks to publishers, writers, artists and scientists who gave copyright permissions.

My parents and brother Franklin gave, over the years, more than they should have, as did my uncle Nick. A friend allowed me to use her basement darkroom to print my early b&w photographs. My good friend Anne Adkins, a retired microbiology professor, loaned her dissecting microscope, which made it possible to draw and describe the small parts in everyone's world. She also reviewed one chapter. My late friend David Scott brought several edgy poems and paintings to the pages, introduced me to the beauty and simplicity of some Chinese poetry, and helped with proofreading. The owl enthusiast Jim Duncan furnished contacts that lead to a couple of great photographs. From Seattle, Imogene Williams sent a copy of *Crow Planet* by Lyanda Haupt.

Sandy and Trevor Kellar invited me into their home. Trevor and I visited two large wintery crow roosts at Chatham and Woodstock, Ontario.

The Polish ecologist Piotr Zduniak was kind enough to email six papers on the Hooded Crow within 24 hours of 1st contact. In the 1980s, it took 6 months to receive an article by mail from Italy. Barbara Combs at Oregon Birds, sent several pages on the Northwestern Crow. Other papers and photographs arrived from birding organizations throughout North America. Interlibrary loans from the Winnipeg Public Library rounded out the



A crow aware of my position near its nest-tree

stack of reading material. Naturally, a few people, mostly from the academic community, refused to help with information I requested. The internet made this book possible.

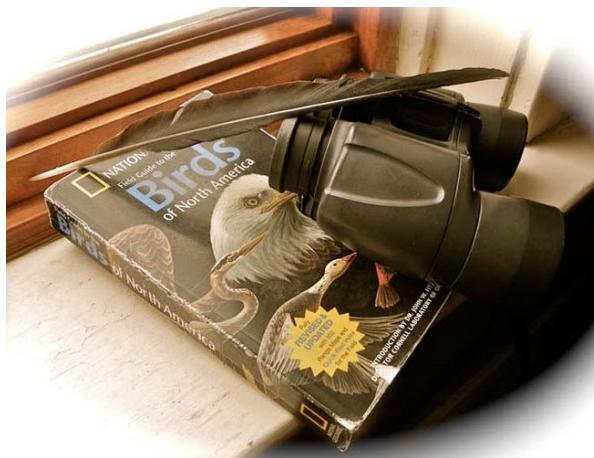
Finally, an appreciative nod to the American Crow for being such a damn good bird to study, observe, draw and photograph. At times the crows loudly complained when I neared their nest-trees, but our relationship improved each year. We slowly and gently got to know each other. ■





INTRODUCTION

Our interest in the American Crow has never been higher. This well-known bird was the sentinel species in helping us monitor the initial spread of West Nile virus across North America in the early 2000s. And now that the crow is nesting and roosting in cities, it is being tagged, observed, monitored, and studied in exciting new ways.



Watching crows was an easy moment for an amateur like myself. Paper, pen, ruler, field glasses and a camera were my companions – and crows

Work on this book began in the early 1980s in southern Ontario, in and around Guelph where I received my BSc in wildlife biology. Most of this book is a compilation of research by others. Parts of the crow remain largely untouched by researchers – physiology, genetics, nervous system, etc. The data from my field work comprises a few pages. Many of the images are mine. Images by others are identified in the captions.

After moving to Winnipeg, Manitoba in the 1990s, I eventually had my 780-page book, **620 Wild Plants of North American**, published by the University of Regina in 2009. After that, I completed a two-year, grant-free study of American

Crows nesting in Winnipeg. Retired, I began revising my 1980s manuscript on the crow and added the results of my recent work on nesting. Over a century of published research by scientists and observers, some in journals new to ornithology, make up the text of this 700-page ebook.

My field work was concerned mainly with nesting, feeding, behavior and roosting. None of my crows were banded. Some of the main researchers in the United States have worked with marked birds for the past 10–20+ years. They have unraveled many of the sex and age related behaviors associated with this cooperatively breeding bird. Rural and urban families of crows continued to have their behaviors compared.

The amount of research available on the internet for amateurs like myself is staggering. Not a part of academic networks, I did not have access to all the current research done on the crow. For example, many theses are only partially available on the web. Research papers on the crow that were for sale on the web were ignored.

It is marvelous to find many women researching the American Crow. And when the New Caledonian Crow revealed to the world its ability to make and use tools, we had to redefine how corvids and humans fit together. Much anecdotal information and great photographs of this captivating bird are on the web. Start at **crows.net** by MJ Westerfield. Online videos reveal avian / crow behaviour as never before.

I avoided a paper publisher. Publishing printable chapters on the web made more sense. No grants or pay helped in the creation of this natural history book. I did the art, design, layout, writing and research. The philosophy and errors in this ebook are mine. If any errors are alarming, please email me and I will try to fix them.

My Wild Plant Profiles are on the web (search **botany and more**). Also visit **tom4photos.com** and **tom4milkweed.com**. Thank you. ■



Art and science are ways to investigate the world we live in. Artists and scientists study the same crow, but from different reflections. The artist studies the collaboration between form, light and background; the scientist wants to know how muscles and flight are related. Lyle Rexer explains, “The purpose of both science and art, then, in the modern sense, is to discover the reality that lies hidden behind, beneath, or beyond appearances” r46.



Common Crow by James Fenwick Lansdowne
© MF Feheley Arts Company

Paintings, sculpture

For the most part, men define crows in art and in everyday living. As a result, crows are associated with masculinity and the attendant feelings of evil, isolation, intelligence and

death. Crows are confined not by the size and shape of the canvas, but by our culture. Women and crows are not the usual mix. Pablo Picasso began to alter some of our simple ideas. In his 1904 canvas, *Woman with a Crow*, he gave us a quiet portrait of a woman nuzzling and petting the head of a crow. Georgia O’Keeffe, an unconventional woman, reached out to us in the 1950s with *Black Bird Series (In the Patio IX)*. She produced a large asymmetrical “V” that could symbolize a crow. There are no feathers to distract us, not even an eye o10.

Slowly leafing through *The Art of Andrew Wyeth*, two egg temperas standout. In *Winter Fields*, a dead crow occupies the foreground as the rolling contours at the horizon echo the gentle slope of the crow’s horizontal body. In *Woodshed*, two dead crows, bathed in harsh sunlight, hang by their feet from nails on the side of a woodshed. Together with their shadows, a strong abstract pattern of death emerges. Both paintings were from the early 1940s, the war years 21c.

Canadian painters, James Fenwick Lansdowne, George Mclean, Glen Loates and Robert Bateman reveal the detailed beauty and some of the personality of the crow through their remarkable wildlife portraits. A crow’s form added lustre to a work by Tom Forrestall and one by Christopher Pratt.

Alex Coleville developed the ethereal, *Crow Up Early* d60. His crow flies quietly over a warmly colored landscape with only a hint of humanity below. The bird is in easy command of the dawn. It is the crow’s time of the day. Thoreau’s words come to mind –

The crow, flying high, touches
the tympanum of the sky for us, and reveals
the tone of it

In the serigraph (silk screen), *Crow with Silver*





Carroña, 2011, by Javier Pérez. Murano glass chandelier, stuffed crows, (120 x 235 x 300 cm). Courtesy of the artist and Venice Projects, © by Francesco Allegretto, with permission

Spoon, the beauty and power of flight are emphasized. The basis for Coleville's 1980 painting, *Seven Crows*, was the familiar rhyme –

One crow sorrow, ...
Seven crows a story never to be told.

In British Columbia, Nikol Haskova (born in Czechoslovakia) works with acrylics to give us stark portraits of one or two crows on a whitish sunlight backdrop with strong blue black shadows. Some of her crows are quite lively. The forerunner of today's flock of bird painters was John James Audubon (1785–1851). In a vibrant, yet awkward style, his images commanded our attention and admiration. In spite of many failures, jail and debt, his frenzy for birds led to the elephantine publication, *The Birds of America*. By depicting a crow near a small bird's nest, Audubon reinforced the crow's awry reputation as a predator.

An exhibition of glass sculpture (Glasstress) was held in early 2012 at the Museum of Arts and Design on Columbus Circle in New York.

One piece, *Carroña*, (2011) by the Spanish artist Javier Pérez exposes a shattered dark red glass chandelier of large flowers and baroque curves on the floor. It is a fallen carcass, and about a dozen stuffed crows are picking at its decaying remains.

From Leonard Baskin, a multi-talented artist, we've received many crow images. Before you ask, it was his collaboration with Ted Hughes that set Hughes in motion to create his remarkable series of crow poems. Two images from, *The Raptors and Other Birds*, by Leonard Baskin b53, extended our perceptual boundaries of how a crow looks. *Crow With Red Sky*, and *The Death of a Crow*, are in his relaxed style. Yet, his birds are very real, displaying the full integrity of being.

We view the death of animals with a peculiar sense of curiosity. Broken, disheveled feathers call for a revised aesthetic on our part. Paul Fournier realized this potential. *Hanging Crow No 2*, is a 1968 etching that clarifies this distraught beauty in a graphic way. He writes –

In death, feathers have a different beauty,





Wheat Fields With Crows, an oil from July 1890, (50 x 103 cm), © Van Gogh Museum, Amsterdam, The Netherlands. From www.tfsimon.com/auvers-sur-oise.html – a superb site on his life

The skeleton its own wonders f60.

An oil painting, *Wheat Fields With Crows*, by Vincent Van Gogh in 1890 is characterized by his saturated colors and charging brush strokes. About 40 crows form a long flock in the bluish black sky. Shortly after this picture was completed, Van Gogh (1853–1890) took his life.



American Crow in a Cottonwood planning its next move to assist mankind

A 17th-century Japanese painted screen depicts 20 crows flying and calling. On the ground an additional 24 vocal crows are gazing upward.

Tightly bunched, yet still vigorous, the crows remain alive in their individual poses l28.

An amusing sculpture, *Crow and Carrion*, (1981) by Bill Woodrow, has one umbrella representing a dead human and another umbrella a crow tugging on part of the corpse.

But after all, it is
No more important than
The tracks of sandpipers
On a wave washed beach.

– Lu Yu r47

Movies and music

Due to poor press, crows have not fared well in the entertainment industry. Starring roles have generally eluded them. A cameo appearance by a crow briefly hindered the intrepid movements of Inspector Clouseau in, *A Shot in the Dark*, a comedy featuring Peter Sellers. Irritated by a crow's presence, Clouseau kills the bird and is immediately arrested for hunting without a license. Movies by Hitchcock can frighten us. In his film based on the novel, *The Birds*, by





Daphne du Maurier (1952), flocks of crows and their allies turned their attention to people. One of our most deep-seated fears became motion-picture true.

Miss Potter was a 2006 movie that recreated the life of Beatrix Potter, the famous environmentalist, writer, and illustrator of childrens' books. After Miss Potter's (Renée Zellweger) publisher Norman Warren (Ewan McGregor) died a few months before their marriage, Beatrix retreated to her room and splurged on her art. One of her images, which became animated through the magic of film, was a scarecrow in a blue coat. When a family of five crows arrived, three landed on the ground. The other two perched on the shoulders of the scarecrow and began to tear chunks of clothing with their bills, as if doing the same to Beatrix's heart.

On the dark side, Brandon Lee starred in *The Crow*, a 1994 movie of murder and revenge.

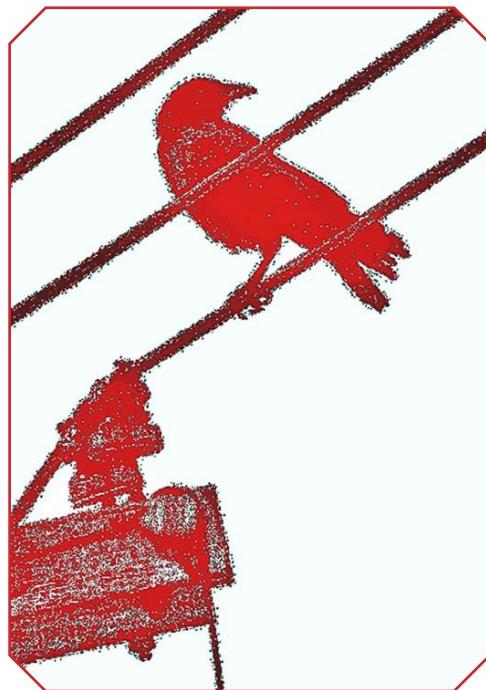
I managed to track down two songs, one new by Joni Mitchell (1976), titled *Black Crow* 32m. The lyrics convey the harmony of a black crow in the blue sky. *The Three Ravens*, an old British ballad dating back to the early 1600s, appeared in *A Canadian Song Book* m12. An amusing version of it, *The Three Crows*, was in the University of Toronto Song Book in 1887. With plenty of wing flapping and cawing in the chorus, the five verses are a discussion among the crows about how they intend to pick clean the bones of yonder horse.

Literature and folklore

Children's stories, bright and colorful, don't often embrace the cast and character of the crow. *Grandmother and the Crow*, is a short, illustrated story by Saunders about a small girl and her grandmother who rescued a young crow from stone-throwing boys. After the grandmother amputated its injured wing, the crow and the dog had the run of the yard. Together all four of the characters indulged in some charming incidents s26. From the imagination of Paine, we have two stories. *Mr Crow and the Whitewash*, as you might guess, is concerned with a crow wishing to change its color from black to white, an idea that fortunately failed. His second tale, *Mr*

Crow's Star Story, is an account of how some of the stars were made. When his wife got angry and hit him on the head, stars flew out and settled in the sky. The illustrations of JM Conde are superb p02.

Through the words of F Russell, enhanced by Cuffari's images, we can follow the journey of *Corvus the Crow* over one year. The 10 chapters



American Crow watching its mate

weave an informative and absorbing story of the crow's adventures in good and bad weather, joy and hardship, love and death. Far away in the land of Zernott lived little Prince Melkan. Playing alone in the woods one day, he got caught in the claw of a huge crow and was flown across the ocean. Destined to be eaten by the Great High Crow, the prince broke free and fell into a swamp. Miraculously, he survived and found himself in Peacewild. His new life was a wondrous series of events involving King Jorg, the Ogre and the ghost of Gibbet Woods 38r.

The fables of Aesop, the Greek writer who lived several hundred years before Christ, have been retold throughout the centuries. Often with a moral attached, those fables that involved a crow usually revolved around the interactions of





the bird with another animal such a snail, fox, or eagle. The encounter between a thirsty crow and a pitcher of water attests to the ingenuity of this bird m93. Modern writers carry on this fabled habit. From the 13 October 1956 issue of *The New Yorker*, J Thurber entertains us with, *The Crow and the Scarecrow*, including a moral t52.

When confronted by the very blackness of the crow, a color some do not regard as a color, our gene for superstition manifests itself.

Crow on the fence
Rain will go hence
Crow on the ground
Rain will come down

– Anonymous

A Brief Dictionary of American Superstitions defines how we relate to an avian world. Swallows, according to Ferm, are birds of good luck, and doves symbolize the Holy Spirit (you can't do much better than that). The crow, however, balances the scale. The black one flying to the left signifies bad news, and if you see one going to the right, you should be on guard for the

remainder of the day. Whoever thought of these implications has never stood beside a crow roost at dawn. If a crow is flying to your left, quickly make a wish; if the bird begins to glide, your wish is assured. However, if the crow's wings keep flapping, you must avert your eyes for your wish to come true. One crow singing near your home is a portent of disaster, but the taking off of one's hat appeases the evil spirit and life continues f19.

Additional folklore, chiefly British I suspect, reveals – when several crows flutter about a man's head, death is coming. Three crows in a row is lucky, two mean a wedding and one sailing over a house foretells a birth. The next time you awake at dawn, count the number of caws. If an even number is reached, good weather is at hand; if an odd number is heard, it will rain. Now you have a better way to forecast weather r02.

In *Sexual Secrets*, “The sexual position commonly referred to as ‘69’ in the West is termed ‘The Crow’ in Hindu texts.” This position serves to release the inner forces of both partners. The crow is thought of as a mystical creature with transcendental powers d59. ■



Song Sparrow at a river's bank



TAXONOMY AND RANGE

2

The family Corvidae is comprised of crows, jays, magpies and ravens. Worldwide, about 116 species exist. Fifteen species occur regularly in North America, while eight species in the family consider Canada pleasant enough. From the fourth edition of *National Geographic's Field Guide to the Birds of North America* (2002), the 8 nesting Canadian members by increasing body length are –

Blue Jay *Cyanocitta cristata* 28 cm
Gray Jay *Perisoreus canadensis* 29 cm
Steller's Jay *Cyanocitta stelleri* 29 cm
Clark's Nutcracker *Nucifraga columbiana* 31 cm

Northwestern Crow *Corvus caurinus* 41 cm
American Crow *Corvus brachyrhynchos* 45 cm
Black-billed Magpie *Pica hudsonia* 48 cm
Common Raven *Corvus corax* 61 cm

The number of species in Corvidae depends on the investigator. For example, two researchers listed 39 species under *Corvus* worldwide: crow 27, raven 9, jackdaw 2, and rook 1 39h. In the same year Walters gave 42 (possibly up to 45) species of *Corvus*, including an extinct one based on bone remains w11. Sibley and Monroe in the 1990s listed 43 species: crow 30, raven 10, jackdaw 2, rook 1 s79. Taxonomy as a means of organizing the avian world varies with the perceptions, ego, and zeal of the taxonomist.

There was a brief interest in the taxonomic relationships of Old World Starlings (several species) and crows, to Old World weaverbirds and New World troupials (tropical American birds of the genus *Icterus*, related to orioles and New World blackbirds). As it turned out, based on DNA-DNA hybridization values, the Corvi are quite distant from the Sturnidae, ie, the American Crow from the European Starling s78.

S Hope pieced together the phylogeny of the



The American Crow is a bird worth watching, not killing

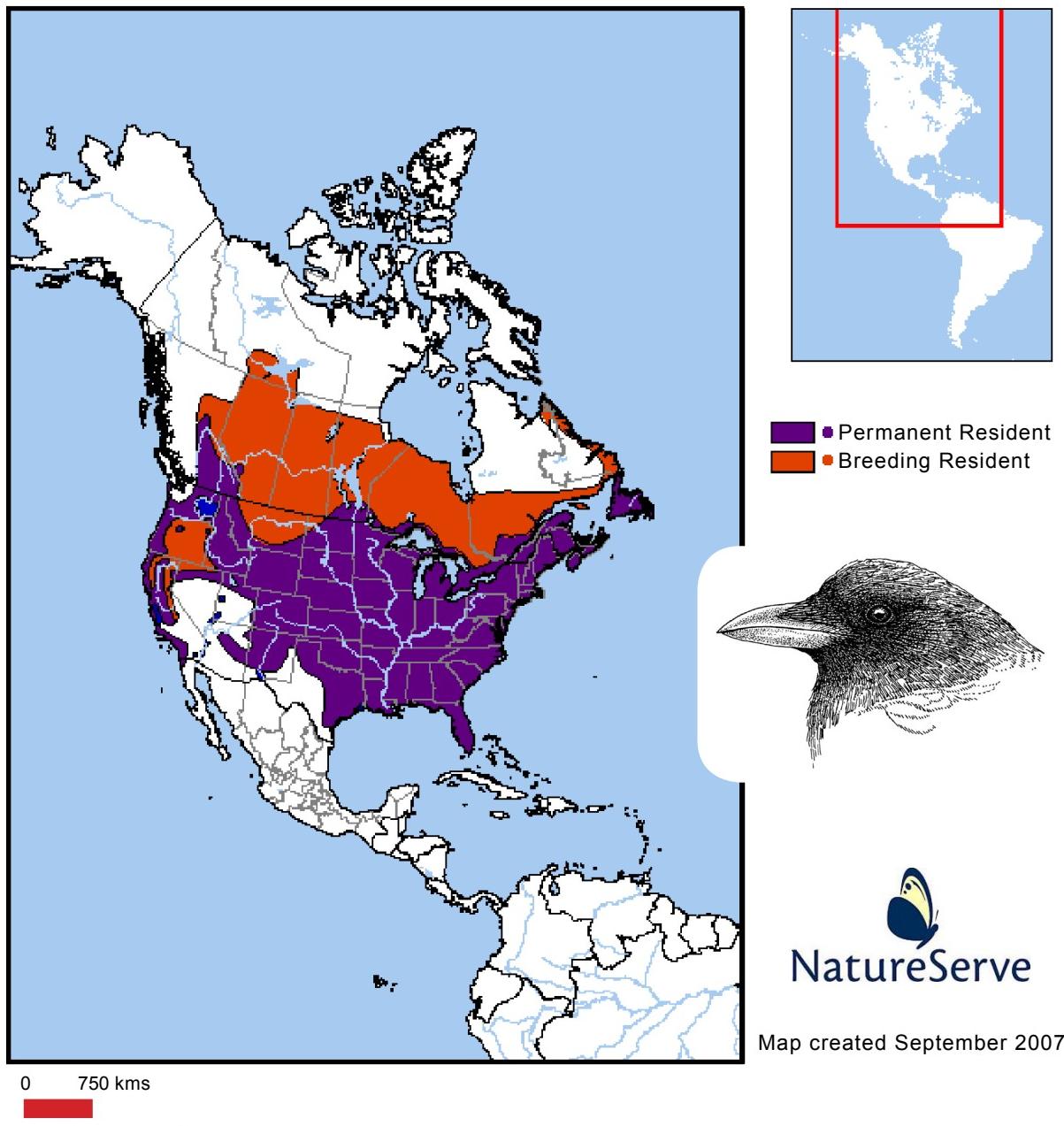
Corvidae from bones and skeletons. The Holarctic corvids included the crows and many other taxonomic groups. The crow-like birds are a monophyletic assemblage, descended from a single ancestor. Geography and phylogeny suggested the Corvidae originated from the western Malaysian region near present day Vietnam and Australia. It was speculated the early corvids were more sedentary woodland birds. With adaptive radiation, the crow-like birds became more mobile and accustomed to an open, less treed habitat 26h.

Canadian range – along the edges

Along part of the **British Columbia / Alberta** border is the only location in Canada where seven of the eight species may be found nesting. The Northwestern Crow plays further west along the



Taxonomy and Range



16. American Crow's range by NatureServe in collaboration with Robert Ridgely, James Zook, The Nature Conservancy – Migratory Bird Program, Conservation International – CABS, World Wildlife Fund – US, and Environment Canada – WILDSPACE, © NatureServe, with permission

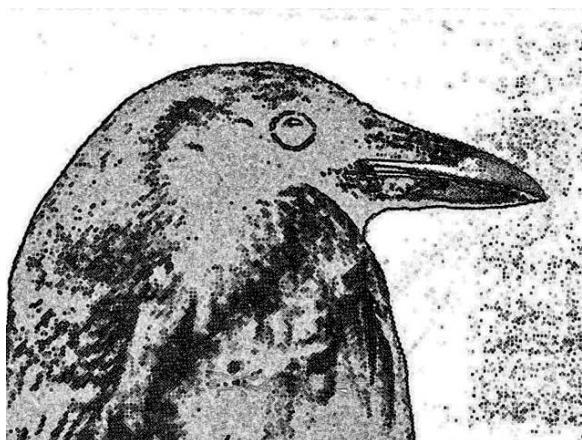
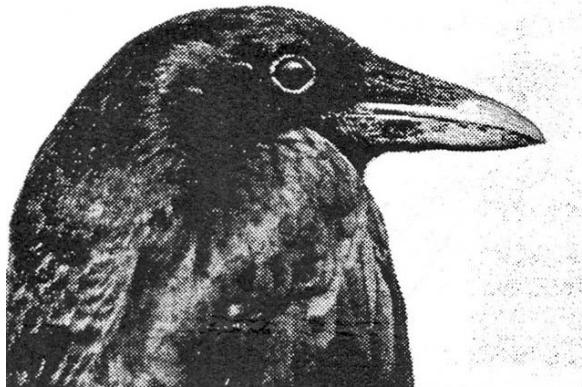
Pacific coast.

Crows frequent the coast on Vancouver Island. Field observers in the 1930s travelled from Comox north to Cape Scott. On the mainland they journeyed from Lang Bay near Jervis Inlet to Kimsquit and farther inland to Stuie in the Bella Coola Valley. In the Comox area, the American Crow (smaller race *hesperis*) was definitely

established. It mixed freely with the Northwestern Crow, especially at Rivers Inlet in July–August 1937, and at Kimsquit in July–August 1939. Here the two species mingled during the breeding season. It was not determined if hybrids were produced [106].

In the east, American Crows prospered on some Canadian Islands in the 1930s. Anticosti Is-





land, 217 km long by 40 km wide, at the mouth of the St. Lawrence River, is part of **Quebec**. An annotated checklist for the island included the Blue Jay, Common Raven and American Crow. “One or two crows were seen each day, some feeding along the shore in the kelp beds. On June 24, three adults and two families of young were observed” 64b. Townsend and Bent traveled along the north shore of the Gulf of St. Lawrence in the early 1900s, in part of what is now Mingan Archipelago National Park Reserve north of Anticosti Island (50° North). This reserve is located in the eastern area of **Quebec**. The Mingan Archipelago, is a chain of about 40 islands (wiki). On Mingan Island several pairs of crows acted as if breeding, and they were common along the coast t70.



The Magdalen Islands in the Gulf of Saint Lawrence are north of **Prince Edward Island**, but belong to the province of **Quebec**. Eight major and seven smaller islands of the archipelago together add up to about 200 km². The crow was an abundant breeder on the islands. A set of 4 fresh eggs was taken on Grindstone on 22 June within 14 m of a barn 16b. The crow was quite tame compared to other locations. Four of them were shot (collected), which was scientifically fashionable in the late 1800s 23c. Avian life was explored on all six islands or groups of islands in the Gulf of St Lawrence plus the north shore and Gaspé Peninsula. The American Crow was found in all 8 places. It was not abundant on the Saint Pierre and Miquelon Archipelago off the southeast coast of **Newfoundland**. Perhaps competition from two gull species over food was the reason. It was also suggested the American Crow may have





A Common Raven on red rocks at the edge of the Grand Canyon in **Arizona**; November 2011

reached Newfoundland rather recently based on its abundance and distribution 028.

In the 1990s, three American Crows occupied the southern part of the **Yukon**. One crow occupied the Whitehorse shipyards from 8 April to at least 30 May. Its calls were recorded to identify and separate it from the Northwestern Crow 48b.

Returning to the west, north and east of Calgary **Alberta**, in the Red Deer River corridor, the crow was fairly common where the river flows through agricultural land and less common in drier regions. As to subspecies based on size, there was too much variation in birds from Ontario to Alberta to recognize subspecies such as *hesperis*. The birds were lumped under *Corvus brachyrhynchos* t11. In 1940, two men set out on a trip by canoe and on foot from Peace River, Alberta to the south shore of Great Slave Lake in the **Northwest Territories**. Ten crows were seen or heard in the lower Alberta portion of the trip in June, and then 10 more in the final leg along the Little Buffalo River in July e05.

Along the northern reaches of the prairie provinces is a region with a cloudy edge as to where the crows stop nesting and living. The absence of trees and lack of settlements are probably a couple of limiting details.

Range

The range of the genus *Corvus* is extensive, but areas such as New Zealand, South America and the far northern reaches of Russia, Greenland and Canada harbor no crows 939. The dense, luxurious forests of South America are credited with inhibiting the southward spread of crows since the birds prefer open habitat j38. On the mainland of North America, the crow was absent from the central plains and the southern Rocky Mountain region in the late 1800s 2b4.

Within the boundaries of Canada and the United States there are three species of nesting crows: American, Fish and the Northwestern that differ slightly in size, area of abundance, behavior and voice. The American Crow was further divided by some into four subspecies. The 1957 American Ornithologists' Union (AOU) checklist a27 provided the following –

Corvus brachyrhynchos [488] American Crow

- (1) *Cb brachyrhynchos* Central and eastern Canada and the USA; widest ranging; introduced into Bermuda about 1840
- (2) *Cb pascuus* Extreme southern Florida
- (3) *Cb hesperis* Western Canada and the United States





(4) *Cb paulus* Eastern and southeastern United States

Corvus caurinus [489] Northwestern Crow
Islands and the Pacific coast from southern Alaska into Washington state

Corvus ossifragus [490] Fish Crow
Atlantic coast from Rhode Island to southeastern Texas, inland along major rivers

The Integrated Taxonomic Information System (ITIS) gave the American Crow the taxonomic issue – 179731. Avibase online identified the crow as – 9E9F24769B6ACBE3

Every now and then a fifth (5th) subspecies of the American Crow is proposed. Phillips and his friend L Hargrave collected a few crows southeast of Flagstaff **Arizona** in 1940. Based on the length of the wing chord, Phillips christened the new bird *Cb hargravei* (The Mogollon Crow) in honor of his friend, and the Mogollon Plateau region in Arizona, their collection site. Compared to *Cb brachyrhynchos* it had a smaller, slender bill, much like *Cb hesperis*. He measured p52 –

Wing Chord Length – the extremes underlined

Cb hargravei

3 females 31–31.2 cm

3 males 32.8–33.4 cm

Cb hesperis

22 females 27.1–30.6 cm

12 males 29.3–31.9 cm

Cb brachyrhynchos from birds in eastern and central Canada j38 –

30 adult females 28.6–32.8 cm

30 adult males 29.5–34.2 cm

In my opinion, all the above samples were too small, especially the tiny sample (3) for *Cb hargravei*. The new subspecies was unnecessary. The range of its wing chord length, although slightly longer than those of *hesperis*, overlapped

with *brachyrhynchos* which left *hargravei* undefined. *Cb hargravei* has not survived in the scientific literature nor in the AOU's Checklists.

Let me finish this taxonomic name calling section with a historical note. The German pastor and ornithologist who gave the American Crow its scientific name was **Charles Ludwig Brehm** (1787–1864). An active observer, he published about 120 papers in German. Wilson, in his *American Ornithology* (1840), identified the crow as *C corone*, which made it identical to the European Carrion Crow 04w. This was a misunderstanding since Brehm had singled it out as *brachyrhynchos* in an earlier 1822 publication, which took precedence 65b. The American Crow has also been called the Common and Eastern Crow,



A tray of skins of American Crows at the Royal Ontario Museum in Toronto, **Ontario**. They provide help with taxonomy, range and art

and *Corvus americanus*. The Chicken Crow was a vernacular name used in Delaware in the early 1900s 2b7.

For those who like rants, Griscom saved one of his best for the names of birds. He wrote





From dinosaurs to birds requires much time but a quick leap of the imagination

"vernacular names in every language, and scientific and technical names as well, are replete with absurdities, inaccuracies, and false taxonomic implications" g71.

The *Dictionary of Birds of the United States*, explains how ornithologists decided on the crow's scientific name. *Corvus* is Latin for raven. In Greek, *brachys* means "short" and *rhynchos* "beak." Together we have a raven with a short beak, *Corvus brachyrhynchos*, since the crow's bill is obviously shorter than the Raven's bill 19h.

Corvus brachyrhynchos hesperis

An early discussion on the status of the subspecies *hesperis* in **Colorado** took up 8 pages in *The Auk*, which outlined the historical sparring. As is often the case, none of the participants had sufficient evidence and time to present a solid argument. Between 1887–1912, both *Cb brachyrhynchos* and *Cb hesperis* were used as subspecies in Colorado. No one thought the two subspecies might coexist in the state. Eventually, with several crow skins to measure, it appeared crows in the eastern half of Colorado may be both *Cb brachyrhynchos* and *Cb hesperis*, while birds in the western mountainous half were *Cb hesperis*. To settle this unimportant argument, a decision should be based of a fairly large collection of crows' skins from throughout Colorado. These skins could be deposited in a local museum for future researchers to ponder b95.

The Northwestern Crow

Another small disagreement continues to echo off the gray walls of our taxonomic corridors. The crow camp was not sleeping soundly. The Northwestern Crow, *Corvus caurinus*, is the main splinter under the skin of the experts. Baird and others initially decided the Northwestern Crow was a bird on its own in 1858 b15. Next, in a short article on observations at Puget Sound in Washington, Bowles described differences in its nesting behavior, voice and tameness compared to the American Crow's, and in a quiet manner generally agreed with Baird 47b. Then, for whatever reason, the AOU's Checklist of 1931 revealed the Northwestern Crow as a subspecies of the American Crow a26. This infuriated Brooks, a notable ornithologist, who cited several reasons why the Northwestern Crow should be entitled to full specific status. Compared to the American Crow, there were differences in voice, behavior and wingbeat. The mighty regulatory AOU was obviously wrong. His passionate plea may indeed have overridden scientific objectivity, because the 1957 checklist presented *Corvus caurinus* in the large bold letters used for full species status 84b.

This set the stage for Johnston who invested considerable time studying the taxonomic procedure. He found the identification of existing crow's skins in museums in the Pacific Northwest confusing. "The maze of problems" forced him to abandon the museums' study skins and seek fresh answers in the field. From over two months of crow watching and collecting (shooting) in Washington and British Columbia, he analyzed the old and new evidence on the basis of voice, habitat, measurements, nesting, fossils and behavior. He concluded "the Northwestern Crow is simply a well marked, ecological subspecies of *C brachyrhynchos*." There was "a zone of intergradation in western Washington where the measurements are more or less intermediate between Alaska and California birds." It was a place where the differences between *caurinus* and *hesperis* were indistinct. Furthermore, he found the very old (mid-1800s) type specimens of the Northwestern Crow in the US National Museum were not sexed and mostly of pre-adult age. Johnston called for new type specimens





21. American Crow Standard taxonomic measurements, length averages (ranges) in cm, from 4 areas in Canada, East to West, © University of Washington Press, adapted j38

	Number sampled *	QC, NB, PE NS NL	ON, MB	SK, AB, YT Keewatin Dist.	Coastal BC
ADULT MALE					
WING CHORD	22–50	32 (30–34.2)	31.6 (29.5–33.6)	31.4 (30.2–33.1)	28.1 (26.5–30.3)
TAIL	22–51	18.3 (17–19.9)	17.7 (15.8–19.5)	17.4 (15.7–18.7)	15.6 (14.5–16.7)
TARSUS	23–51	5.9 (5.5–6.5)	5.8 (5.1–6.2)	5.8 (5.2–6.1)	4.9 (4.5–5.3)
BILL **	22–52	3.7 (3.4–4.4)	3.5 (3.2–3.8)	3.5 (3.1–3.7)	3.3 (2.7–3.7)
ADULT FEMALE					
WING CHORD	12–47	31.1 (30–32.2)	30.6 (29.0–32.8)	30.1 (28.6–31.4)	26.9 (25.7–28.3)
TAIL	8–49	17.7 (16.8–18.4)	17.1 (16–18.7)	16.6 (15.4–17.6)	14.8 (13.6–15.8)
TARSUS	15–51	5.6 (5.2–6)	5.6 (5.1–6.1)	5.5 (5.2–5.7)	4.7 (4.2–5.1)
BILL **	15–53	3.5 (3.2–3.9)	3.4 (2.8–3.8)	3.2 (2.9–3.6)	3.1 (2.9–3.6)

* Number sampled is a range for the combined 4 areas in Canada
** Measured from the anterior edge of the nostril to the tip of the bill

more typical of *caurinus*, to be collected from coastal Alaska j38. Another researcher felt the Northwestern Crow, *C caurinus*, was easily separated from the American Crow. At the same time, he also found it difficult to understand how the 3 subspecies – *paulus*, *pascuus* and *hesperis* could be maintained t57.

Johnston j38 too, recommended in his small 1961 book, *The Biosystematics of American Crows*, that the status of *Cb paulus*, an eastern race, was unjustified. He would rather have it included within *Cb brachyrhynchos*. He thought *Cb hesperis* should be maintained as a subspecies in California, Oregon, eastern Washington, Idaho and eastern British Columbia. Fortunately, most of his work and evidence brought some sense to the system. Although the 1983 AOU's Checklist kept *C caurinus* at full specific status, it did for the first time eliminate all four subspecies of the American Crow a28. I will treat the Northwestern Crow separately since others do. Johnston's book has a table of measurements of American Crows for 17 areas in Canada and the United States. To provide some indication of the range in size of the crow, I have extracted his figures for Canada and arranged them in an east

to west review (**Table 21 above**). Both sexes of adult American Crows, *C brachyrhynchos* are progressively smaller from the east coast to the west coast.

In Oregon, where the ranges of the two species of crows may overlap and hybrids may have fledged, birders generally reported smaller crows along the coast as Northwestern Crows. But since juvenile and female American Crows are smaller than adult males, the smallness may not automatically indicate a Northwestern Crow is in your binocular vision j38, b61.

Meinertzhagen mentioned the direction of the nasal bristles of the two species may serve as a point of separation 12m. Supposedly, the configuration of nasal bristles of the Northwestern Crow meet along the culmen ridge, and nasal bristles of the American Crow are mainly along the sides of the bill's dorsal aspect. In museum specimens, this difference in nasal configuration is tricky to separate. Eventually, it was agreed more work on living birds in the field, including photographs of the bill to show the differences in layout of the bristles, if it existed, would be helpful p22. However, before you rush into the field, a close read of M's publication showed the size of the bird





was the discriminating factor, not the bristles b61.

Bayer b62 studied four measurements of crows from **British Columbia** south into **California** from two published sources – Godfrey 929, and Johnston j38. There was much overlap of phenotypic measurements between *Corvus brachyrhynchos*, *C caurinus*, and of Californian fame, *Cb hesperis*. In the Burke Museum at the University of Washington in **Seattle**, a close look at specimens of *Corvus brachyrhynchos*, *Cb hesperis*, *C caurinus* and *Cb paulus*, the latter from Maryland, resulted in no separation of species or subspecies based on nasal feather characteristics. The crows (*Cb b*) from Michigan had slightly longer nasal bristles than any of the other dead crows in the Seattle museum p23. With no firm conclusion, more research was advised r18.

The relative size of birds in the field can be deceiving. First of all, birds vary in size over their range, especially when the range is as extensive as the American Crow's. Along with sexual dimorphism, the feeding habits, time of the year, migration, and breeding status are additional variables to consider.

Sibley and Monroe did not resolve the intrigue concerning the Northwestern and American Crows. They wrote “Probably conspecific with *C brachyrhynchos*, but the conservative approach is to consider *C caurinus* an allospecies” s79 [allospecies = speciation occurring when biological populations of a species become isolated due to geographical changes such as mountain building or social changes such as emigration (wiki).]

DNA barcode

New diagnostic tools to identify species have emerged. For example, one tool embraced the worldwide population of Common Ravens in the Northern Hemisphere. From ravens' tissues,



American Crow nasal bristle arrangement



mitochondrial sequence and nuclear microsatellite data revealed a separation of ravens in the western USA (the California clade) and ravens everywhere else in the world. “Ravens from Minnesota, Maine and Alaska are more similar to ravens from Asia and Europe than they are to ravens from California. In addition, the restricted range for the Chihuahuan Raven (*Corvus cryptoleucus*) of the southwest United States and Mexico is genetically nested within the paraphyletic [descended from a common evolutionary ancestor or ancestral group] Common Raven” o13.

DNA barcode analysis is based on the remarkable observation that a short DNA sequence from a standardized locality on a mitochondrial genome enables the identification of animal species. Applications of molecular systematics for birds was pioneered by the late Charles G Sibley. A comprehensive library of the gene cytochrome c oxidase 1 (CO1) sequences of named specimens is taking shape. Its purpose is to ease the naming



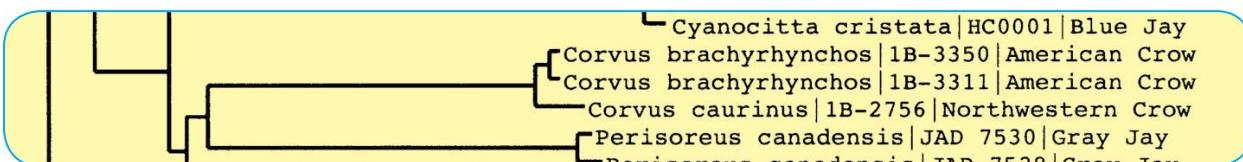


A Common Raven in Arizona raised its breast, belly and flank feathers and held them that way for a few minutes – courtship? I haven't seen crows perform this feathery feat, November 2011

and separation of species. The Consortium for the Barcode of Life (CBOL) held its first meeting at the Smithsonian Institution in May 2004. One of CBOL's principal goals was to create a global reference library of DNA barcode sequences that was blended with other biodiversity information (databases of specimens, species and biogeographic information). As of 2009, databases of CO1 sequences included at least 620,000 specimens from over 58,000 species of animals (wiki).

Recent genetic work dealt with sequence diversity in the 648-bp (bp = base pairs) region of the mitochondrial gene CO1. The mtDNA was used because it evolves more rapidly than nuclear DNA. This helps to separate closely related species. Mitochondrion is an organelle occurring in large numbers in most cells. It is where the biochemical processes of respiration and energy production occur. The CO1 barcode was tested on 260 species of birds. "All species had a different CO1 barcode(s), and the differences between closely related species were, on average, 18 times higher than the differences within species." The average Kimura-2-parameter (K2P) differences between species was about 8% and within a species about 0.4%. As might be expected, the K2P for each of the American Crow and Northwestern Crow, both of the genus *Corvus*, fell well below the between species average of 8% mentioned above. The two corvids showed an interspecific distance of less than 1.25% h53.

Then a paper was published in which 643 (93%) of the breeding and pelagic birds of North America were listed according to mitochondrial DNA barcoding analysis. Although the numbers tested were small (2–4 birds), the three crow species – American, Northwestern and Fish, appeared distinct, with none being provisional species, as in the Common Raven mentioned earlier. But, in the same article, they place the American Crow and the Northwestern Crow in a list of species with greatly overlapping barcode clusters. These two troublesome species of crow had a 99.5% overlapping level. Three possible explanations were provided for this closeness. So it appears the two species are almost one. Even with genetic analysis, the fence between the two species remained partially open k36. Since the subjectivity of the researchers can alter the interpretation of the results, a larger sample from



The American and Northwestern Crows are genetically close according to this complete neighbor-joining (NJ) tree based on Kimura-2-parameter (K2P) distances at CO1 for 437 sequences from 260 species of North American birds h53





24. The Great Basin in the southwestern United States – an area with a shortage of American Crows. Copied from Wikipedia: <http://upload.wikimedia.org/wikipedia/commons/5/56/Greatbasinmap.png>

different parts of North America, as well as some hybrids, may help. Meanwhile, field biologists can maintain their hunt for a definitive way to externally separate these two western species. Maybe it's all in their toes.

The size of the genome (an organism's hereditary, genetic material in a cell) of birds in the late 1980s was revealing. When the data were standardized, "the genome size of birds is the most conservative of any vertebrate class and, all values considered, is smaller and more uniform in size than previous estimates would indicate" t53.

Around 2008, passeriformes were shown to have an average genome size of 1.32 picograms (1 pg = one trillionth of a gram). For two members of the Corvidae family, the genome size was about 1.29 pg. A positive relationship was discovered between genome size and nucleus / cell size, along with genome size and wing loading

index (an indication of adaptation for efficient flight). This suggested a small genome size in birds was somehow related to the ability of flight. Just the same, wing span and aspect ratio [the ratio of length to breadth, with a high aspect ratio indicating rather long, narrow wings] did not seem to be linked to genome size in any conclusive way a44.

Finally, the interrelationships of a few Corvidae still remain somewhat contradictory. A look at the tongue indicated dietary shifts may have been responsible for shifts in its skeleton m21.

The Great Basin and vicinity

Richards visited the Great Basin in the 1960s. He mentioned that certain areas hosted thousands of wintering American Crows. Along with notes on nesting behavior, he measured 29 adult breeding crows taken over the summer and 14 adult wintering birds. He was trying to determine subspecies for this dry area. He presented four standard

lengths as ranges –

wing chord 29.7–33 cm

tail 17.3–19 cm

tarsus 4.6–6 cm

bill 2.9–4 cm (front edge of nostril to bill's tip)

He gave these comparative wing chord lengths –

GREAT BASIN

Female – breeding 30.5 – wintering 30.6 cm

Male – breeding 31.7 – wintering 31.9 cm

EASTERN CROWS VS WESTERN CROWS

Female – east 30.3 vs west 28.1 cm

Male – east 31.3 vs west 29.4 cm

He concluded all the crows in the **Great Basin**,





with wing chords over 30 cm long, belonged to the eastern subspecies *Cb brachyrhynchos* slicing through the dry morning's air 153.

The crow was very rare in the Great Basin during explorations in the 1860s 175. For at least the first half of the 1900s, the breeding-range map of the crow was left blank in parts of the Great Basin region. Recent reports from each state are slowly filling these blanks.

For example, the western **Great Basin** has experienced an increase in the crow population over the last 15 years, "especially around farms and ranches, often up to hundreds at a time." Crows were nesting at the University of Nevada campus at Reno. In the western side of Utah the crow was an infrequent localized breeder, but was more common over the winter. In some towns and cities of western Nevada, crows were becoming urbanized. F Ryser stated "During the spring and summer of 1981, the entire area in and around the cemetery in western Winnemucca was alive with crows. During the winter months of 1983, a large group of crows frequented a residential district in Reno just south of the Truckee River on California Avenue" 41r.

Utah

Early visitors to this state noted a few crows here and there. For instance, two crows were seen near Provo, Utah 176. In a check-list (1944), the crow was listed as an "uncommon permanent

resident in valleys" b75.

There were 2 records in 1942 of American Crows nesting in Utah. A sample of recent observations included four pairs of crows nesting in willows in Lost Creek Canyon, Morgan County. Then in June 1962, about 300 crows nesting in thickets of willows and hawthorns were located in the north-central part of the state in Rich County along the Bear River. 152.

In mid-November 2011, I made a brief trip to the southwest USA to look for crows. Walking around **Salt Lake City** for a few hours in the evening and at dawn the next morning, I neither saw nor heard crows. It was a little spooky for an easterner like me. Traveling by van in the morning from Salt Lake City along highway 15 to St George in the south west corner of Utah, crows were intermittently observed from the road, mostly at ranches. Eastern crops did not exist. My driver, Calvin Hunter, was a solid spotter of crows and hawks. A few small road-killed animals and one recently crushed deer were seen. No birds attended the carcasses. The largest group of crows was five (a nesting family?) in a total of 25 during the trip. Except along the rivers, trees were absent. With little agriculture or trees, few crows take up residence. In Saint George, crows were again absent in the afternoon and at dawn. From St. George to Las Vegas, 2 crows were noted along highway 15. No caws entertained my ears in Vegas. In the afternoon I visited the Donna Beam Art Gallery at the University of Nevada, Las



American Crows are thinly distributed in the American southwest. The undulating greens of low desert plants in November echo the uneven crest of a distant mountain range





Vegas. The campus, with numerous, tall coniferous and deciduous trees, was without crows, but a Cooper's Hawk landed in a deciduous tree.

New Mexico

In the 1920s, Jensen spent five years working and birding in Santa Fé County, New Mexico. The crows nested in cottonwoods along the Pecos, Nambe and Rio Grande Rivers. Fresh sets of eggs were noted in the latter part of April j23. Residents mentioned crows appeared more abundant in the 1930s. One crow was collected in 1935 and 1940 from each of Mora and Santa Fe Counties in north central New Mexico 48h. They were judged to be *Cb brachyrhynchos*, in agreement with Johnston j38. In the late 1910s, several pairs of crows nested around Lake Burford and visited the shore daily. They hunted for beetles, or flew low over the rushes searching for nests of blackbirds. Male Yellow-headed and Red-winged Blackbirds mobbed them w62. The Lake Burford area in north-central New Mexico was revisited forty years later. No crows were seen. Three crows, however, were observed at Thompson Lake on 8 June 55h.

Monson spent two short periods in Socorro County and along the Rio Grande Valley. Large numbers of crows invaded the Rio Grande Valley from 29 December 1941 to 31 March 1942 41m. The previous winter a flock of 20 crows was seen on the Bosque Del Apache Wildlife Refuge on 23 February. At the same refuge in south-central NM, the American Crow was common in the spring and fall, and abundant over the winter u05.

Rickard visited San Miguel County in northeastern New Mexico 75 years after Batchelder did in the early 1880s. Although the American Crow was not on the list compiled by Batchelder, Rickard noted crows in cottonwood habitat along a narrow stream. The changes in land usage, including increased agriculture, was believed to be the reason for the increased presence of crows and magpies in the late 1950s r70. The American Crow continues to expand in the state. In the early 2000s an active nest was at Mills Canyon on 23 May and at Paradise Hills in April 01w.

I posted a comment online about two crow roosts I visited in southern Ontario. On 4 February

2012, this was the most interesting reply –

I live outside Glorieta, New Mexico, just east of Santa Fe, and have several hundred crows who hang out here year round. I have several acres in a pretty much "natural" state but also a feeding area for a variety of birds. The crows move from the front to the back of the house and the smaller birds simply alternate with them. The crows will eat just about anything – but they are not fond of pickles (from a forgotten picnic lunch plate) although a dozen or so did try them.

Nevada

Hoffman in the 1880s saw crows in Big Smoky Valley and near the Bull Run Mountain in central Nevada 10h. In Lahontan Valley in Churchill County, crows were residents and a nest with 6 eggs was found on 4 April 1939, and on 24 May another nest cup held 3 nestlings a08. An account of crow activity in southern Nevada – "A common winter visitor in at least the Moapa and Virgin Valleys, arriving as early as 10 October



Saguaro, *Carnegiea gigantea*, in Arizona's Sonoran Desert, or at the University of Nevada in Las Vegas, whichever is closer



Taxonomy and Range



1951, and remaining as late as February 28 1952. One summer record, from Pahrump Valley, August 25, 1951." Another birder mentioned crows in the Pahrump Valley into March of 1891 983. The American Crow was an uncommon resident in the state, with more birds probably present in the winter. Hoffman found a considerable number of crows nesting on the rocky walls near Bull Run Mountain in Elko County in north-eastern Nevada. Several small sightings were recorded by other individuals and parties. Several hundred crows were seen at dusk on 19 August 1933 at the head of the Humboldt River in Elko County in



The Joshua Tree, *Yucca brevifolia*, is sparse in open country in the southwest USA. Ravens sometimes nest in it. Humwichawa by natives

the north-eastern part of the state. On 20 August 1933, about 500 crows were in Paradise Valley eating the bitter, reddish-orange fleshy, 5–7 mm wide fruit of Buffaloberry, *Shepherdia argentea*, in north-central Nevada 147. In Lander County on 26 May 1932, a newly fledged crow was at Wells. On 30 May 1948, two were on the Charles Sheldon Refuge in Washoe County in north-western

Nevada g02.

A general vegetative picture of **Nevada** consists of 8 zones. © Washoe County, Nevada website –

Northern desert shrub (37%)	9 million ha
Salt desert shrub (33%)	10 million ha
Pinyon-Juniper (14%)	3.7 million ha
Southern desert shrub (11%)	3.1 million ha
Mountain brush (2%)	0.5 million ha
Grass and forb	0.06 million ha
Coniferous forest	0.20 million ha
Alpine	0.04 million ha

Death Valley

As an elevated footnote, Death Valley in **California** is the hottest (57 °C) part of the Great Basin and lowest at 86 m below sea level. Magpies were regular visitors – the largest group of 10 birds. The American Crow was twice observed flying over the valley. In the 1930s, at Stovepipe Wells Hotel, two ravens went after a crow and chased it into the hotel's lobby g20.

A list of birds was compiled from the Death Valley region of Inyo County **California** over the last 17 days in October 1933. On it, American Crows (1 or 2) appeared as vagrants several times at or near Furnace Creek Ranch g70.

Monson did a little birding at the junction of Nevada, California and Arizona along a short stretch of the Colorado River in California. On 14 December 1947, a flock of eight crows were with a flock of 10 Common Ravens. The flock apparently wintered – 6 crows were observed on 7 February 1948 and 3 crows on 4 March 1948 42m.

Arizona

My day trip by bus from Las Vegas to the Grand Canyon in **Arizona** was rather uneventful without crows to animate the scenic desert. However, at the west rim of the canyon in early December, about 25 Common Ravens scrounged some of their food from tourists. I fed them part of my turkey sandwich. In return they posed for several pictures. Ravens probably nested on ledges along





the walls of the canyon. In a light wind, the ravens dropped over the edge, then glided majestically upward on open wings, soaring above the canyon and clumsy humans on the rim. The wing tips of ravens extended to the tips of their tail feathers or slightly beyond. In American Crows the wing tips do not reach the tips of their tail feathers. When I talked to a Native at the rim, he said they refer to ravens as crows.



The canyon of all canyons – the Grand in Arizona, west rim – American Crows find life more rewarding elsewhere

In an area northeast of Tucson and near the border of New Mexico, Scott saw his first few crows in the 1880s at the head of Mineral Creek. In the spring and fall, very large flocks appeared in the foothills of the Catalina Mountains to the northeast and very close to Tucson. Crows were not seen over the summer and nests were not located s46.

The American crow was uncommon in Arizona in the early 1900s. From other observers, there are 4 records for the state: Fort Apache (November), Santa Catalina Mountains and Mineral Creek (migration), Mogollon Mountains (breeding), and San Francisco Mountains (uncommon) 96s.

Hargrave spent some time in the San Francisco Mountains, just north of Flagstaff in the central part of Arizona. His observations on the American

Crow were as follows – flocks of 6 (24 April), 25, 150, 2, plus several sightings of 1 and 2 pairs in March. All flocks were flying west to avoid the high mountains. In late September 1931, 20 crows were near Flagstaff h31.

Huey and a party of three, from 23 June to 24 July 1933, were in the White Mountains, Apache County, Arizona. The county is central, but slightly nearer the eastern border of New Mexico. At an

elevation of about 2,600 meters, a flock of several hundred crows spent the summer on a high prairie near their camp. One was collected on 9 July. The outing was sponsored by the San Diego Society of Natural History 53h.

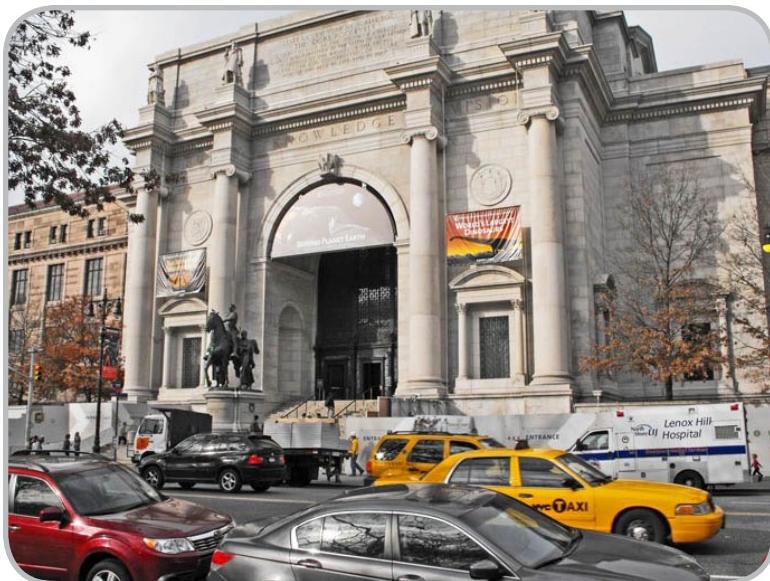
Dickerman saw about 20 crows in a flock several times in February and March 1952. The flocks were at the north end of Roosevelt Lake, northeast of Phoenix. Two adult males from the flock were shot on 20 March and each placed in a different subspecies based on length of tail and wing chord. On 13 April 1953, during the breeding season, a pair were spotted in the same area, which was not the usual breeding range for American Crows. The Transition Life-zone was where they usually nested in Arizona d47.

A solitary crow (seen by Chuck LaRue) was reported on 10 July at Cow Springs Lake in Arizona. Breeding birds were in the Chuska Mountains 44s. Two crows were noted at Jeddito Arizona, west of Keams Canyon on 4 February, and 20 birds from Roper Lake on 9 February 45s. A year later, in 2006, Stevenson and Rosenberg reported a lone American Crow near Granite Creek outside Prescott in central Arizona on 18 May, and on 24 May a pair in the same area exhibited breeding behavior 46s.

One crow was observed along the Santa Cruz River in Tucson on 26 January 1999 j56. That same year, American Crows “staged a mini-invasion” into lowland areas in October and November, but the numbers fizzled out as the fall progressed j57.

A crow was located on 2 August 1995 on





The entrance to the American Museum of Natural History in New York City faces Central Park, mid-December 2011

the Black Mesa near the town of Kayenta in the northeastern part of the state 15r. The American Crow was described as an occasional visitor to the Sulphur Springs Valley in recent winters. However, on 29 December (20 crows) and 19 January 1996 (100 crows) were observed in that area. It was described as a flight year 16r. Crows were away from their usual nesting areas. At Pasture Canyon east of Tuba City, 17 were seen, and later a flock of about 70 crows gathered near Pinetop on 16 November. In the 2005 Breeding Bird Atlas of Arizona, there was breeding evidence in 5% of the 1,834 priority blocks. Crows nested around Flagstaff and eastward to the border of New Mexico 20c. Due south of Arizona, at the small town of Yecora in Sonora state, **Mexico**, on 10 November, one crow was closely studied. It was perhaps only the second record for an American Crow in this part of Mexico b81.

New York City

In mid-December 2011, I visited **New York City** to explore dozens of art galleries, including MoMA and the International Center of Photography. Setting up camp at the Chelsea Lodge (highly recommended) on 20th Street, I was away from much of the bustle common to 6th Avenue. Walking around

the city, including a few hours in Central Park across from the American Museum of Natural History, not one blackshirt was seen or heard. Even at dawn, while walking to a restaurant for breakfast, the warm calm air did not carry the sound of a caw. Nor was a distinguished pair of beating black wings observed. House Sparrows, Rock Doves, Mallards and Chickadees were the most common avian encounters. The Hudson River with its bordering parks attracted gulls.

Elsewhere

Along the coast of **Texas**, between Houston and Corpus Christi, at the Wolf Point Ranch, 7 American Crows were observed on 28 May 1920. This was unusual. Locals admitted they had never seen American Crows in the area p24.

Among the winter birds in the region of Biloxi **Mississippi**, American Crows did not mingle with the Fish Crows, and they utilized deciduous woods and fields where they were fairly common. Fish Crows, identified from American Crows by their voice, were as abundant as gulls along the shores, and numerous on Gull Island, but absent on Ship Island 12 miles (19 km) out to sea 22c.

In the Atlantic Ocean the American Crow was an introduced breeding bird in **Bermuda**, about 1,600 km east of Savannah, Georgia a32. Kennedy gave a bit of its background in Bermuda. The earliest collection in February 1875 was by Captain H Edmund. This crow now rests in the British Museum k33. In the late 1800s the crow was declared nuisance ornithology in Bermuda. The crow became very numerous and damaged crops, especially the Indian corn, and killed young chickens and ducks. With a bounty of half a crown, the crow was almost exterminated, with only a group of 5 remaining in the Walsingham neighborhood p96. Today the crow remains viable on the island.





Crows have a gigantic body,
Composed of thousands,
Moving like an inky cloud of pumping crows' hearts,
Like a text balloon moving forth from the lips of god,
Here and then gone,
Like all miraculous revelations,
Chopped into tiny pieces by the scientists,
Who never smile in public for if they do,
Between their teeth,
The remnants of crow feathers,
Fingers stained with the orange of beaks.
Their wives have left them
For their habit of inhaling raw meat,
Cawing in the basement,
Moving their arms as if they were feathered wings,
Hooking the backs of their knees over branches
when the children are watching.

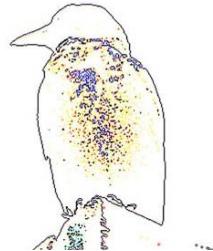
– David Scott 2011

***Corvus unicolor* rediscovered**

ScienceDaily (13 October 2009) — Known to science only by two specimens described in 1900, this endangered crow has re-emerged on a remote, mountainous Indonesian island. The Banggai Crow was thought to be extinct. Indonesian biologists finally secured two new specimens on Peleng Island in 2007. The rediscovery was spearheaded by professor Mochamad Indrawan

of the University of Indonesia, chairperson of the Indonesian Ornithologists' Union. He was assisted by collaborator Yunus Masala and by members of the Celebes Bird Club. The new specimens are in the Museum Zoologicum Bogoriense in Java.

Pamela Rasmussen, a professor of zoology at Michigan State University, and renowned species sleuth, provided conclusive verification. She studied the four, 200-year-old specimens known as *Corvus unicolor* in New York's American Museum of Natural History. She compared them to the new crow specimens in Indonesia's national museum. The more common Slender-billed Crow, *Corvus enca*, was also found in the Banggai Islands, and likewise was all black. “The morphometric analysis I did shows that all four *C unicolor* specimens are very similar to each other, and distinctly different from *C enca* specimens. We also showed that the two taxa differ in eye color – an important feature in *Corvus*,” Rasmussen said. “Not only did this confirm the identity of the new specimens but also the specific distinctness of *Corvus unicolor*, which has long been in doubt.” ■



Spiny ribs of the Saguaro symbolize the Arizonan desert





THE STAGE

Essex County is etched in my memory. Like an adult salmon returning to its natal stream by smell, it is the perfume of the county's air on a damp autumnal morning that tells me I'm home.

Southern Ontario is well-endowed with a generous climate and diversity of crops. Two cities where I studied crows will serve as landmarks. Windsor **Ontario** in Essex County (lat. 42° N), represents the most southern part, whereas Winnipeg **Manitoba** (lat. 50° N) embodies the northern prairie. The average January temperatures range from -5 to -18 °C respectively; in July they range from +23 to +20 °C. In Winnipeg crows endure from -40 to +40 °C. Seized by the Great Lakes, Windsor has an average 179 day growing season compared to 119 days for Winnipeg (online). Crows nest in both locations, but the culture of southern Ontario permits the formation of large wintery roosts. Winnipeg is without large roosts in the winter, but some families of crows do overwinter on their nesting territory in the city.

The harvest from the flatlands of Essex County includes sweet and grain corn, soybeans, peas, tomatoes and winter wheat. Further east in Ontario, grain corn, hay, pasture, oats and barely provide a sense of cornucopia on the numerous dairy farms from London to Guelph.

Stopping to look and listen in southern Ontario, you quickly realize the hedgerows and small remaining pockets of woodlots attract the first spring migrants in late February. Nests begin to appear in March. In June, when the first cut of hay smells sweetly, many young crows have left (fledged) their nests. The yellow panicles of goldenrods in August coincide with the appearance of the first small flocks of crows decorating the landscape.

Crows flying in a southwestern direction in October encounter Lakes Erie, Ontario and Huron. Near these large bodies of water the

major winter roosts spring to life at Essex (now empty), Chatham, Woodstock, Hamilton and St. Catharines. The most recent was at Coronation Park along the Rideau River in Ottawa. Many cities have a year-round population of crows. The migratory urge that draws their country cousins southward in October is not honored.

Studying a courage of crows in the field requires patience and eyes wide open. Crows follow routines and are ordinary birds until that one time when you observe them doing something extraordinary. Travel was short. I began my studies when I stepped outside my home. The commonness of crows is a definite advantage for an amateur bird-watcher with no grants, assistants, or laboratory.

Sitting in my parked pickup truck, with field glasses focused on a nest or a feeding crow, made me a curiosity in Guelph. People peered furtively at me from their windows. One man admitted to watching me through his binoculars as I was watching crows through mine. Sometimes people gathered their courage, walked outside and actually began to talk with me. Every so often a worthwhile conversation resulted, especially when the person liked crows. More often, people phoned the police. Standing beside my truck, an officer always asked the same question, "Who are you looking at?" They never asked, "What are you looking at?" They requested ID and added that they received a complaint about my behavior. We talked and then, convinced of my ornithological intentions, but perhaps not the merit of my work, they left me in peace with my courage of crows.

In Winnipeg in the early 2000s, I studied the nesting habits of crows for 2 years. I rode the bus and walked. As I stood outside a home watching a crow's nest, a man told me I made his wife nervous. When I explained my purpose, he seemed pleased. ■



COLOR

4

Not a member of the glitterati, the crow must be content, as is a well-dressed woman, with simple elegant black.

At a distance, against the browns, blues, whites and greens, the American Crow is indelible – a dark silhouette. But up close, in sunlight, the brown eye captivates, the bill shines, and rich tones of metallic violet-blue highlight the plumage. Unlike the male Scarlet Tanager, whose contrasting colors serve to define the wings, eyes, bill and tail from the rest of its red body, the crow has no such pattern. This evenness, however, serves to identify it more easily than sparrows with their tangle of brownish colors.

From art and fashion we have developed attitudes about this stygian color. “Elegant black can suddenly make color look foolish,” writes Anne Hollander on its cultural role. “Black is everything and nothing, a color vibrant with a mysterious ambiguity, a color that allows whatever takes it on to enjoy total associative freedom.” She continues, “Colors are worn by those who prize rude health, lively fellowship, and simple views. Black suits those who challenge all simplicities, keep to themselves, brood a lot, and seem to be dangerous even if they do nothing. Black is the color of the unknown In a frivolous and colorful world, black is serious. Indeed, in certain perverse, extreme circumstances, it is far more than that—it is sinister” 18h.

The extreme authority of black remains popular with poets.

Here I enter the domain of black

White is nothing, neither space nor light
white is empty without black to mark it
flog it, bring it to life

– Roland Giguere 1976 g17

Field guides, those pocket-sized bird identification manuals, are not meant to flatter us with their prose. Roger T Peterson tells us the crow is an “ebony-hued bird that needs no description” p45. A much more complete picture of the crow’s plumage can be read in, *The Bird Life of Texas*, which may be useful in a museum / taxonomic setting 004. Earlier, Johnston decided the subspecies of the American Crow could not be separated “on the basis of color alone.” He did however, find the American Crow could be singled out by its plumage coloration from the Fish Crow and the Caribbean species j38.

Most people, including birders, would describe the female and male crow of equal color; ie, sexually monochromatic. That is our assessment based on what we see. Recently however, avian perceptions of their world were found to be





somewhat different than our evolved reality 58c. To determine if our definition of monochromatic had any value, a color discrimination threshold model was used to test feather patches on fresh museum skins of 166 North American passeriformes that have been described as being sexually monochromatic. MD Eaton discovered 92% of the 166 species had a color threshold discrimination patch related to their sex and were dichromatic to each other. The Northwestern Crow, Fish Crow and Chihuahuan Raven were found to be monochromatic. Feathers were tested on their back, head and chest areas. From the results of the two black crows, I shall assume the untested American Crow is also monochromatic, with both sexes the same color e04.

Why Black?

It is difficult to understand the features in a bird's evolutionary history that select for a particular color pattern since the range of patterns and colors among birds is so great. I don't believe there is a general rule of coloration for birds which correlates with a particular lifestyle, geographical range, or body size.

In the 1980s, there was disagreement over whether the conspicuous colors of birds were due to sexual selection, or the unprofitable prey theory. With the sexual selection model, the higher level of predation was predicted to fall on the most conspicuous birds, usually the singing males. The unprofitable prey theory predicted the opposite—the most cryptic birds were thought to suffer the highest predation rate because the



Pictures of crows on the web, March 2012





conspicuous, brightly colored birds (males) advertised they were difficult to catch and should be avoided by predators b18. A recent note by Baker reviewed some of the evidence (pro and con) from the scientific community in this debate over the purpose of coloration b20. To test the two theories, field experiments in **Sweden** involved stuffed, normal Eurasian Magpies versus magpies dyed brown. Goshawks attacked the normal and cryptic magpies with about equal frequency. Thus there was “no aposematic (coloration serving to warn or repel predators) role in the coloration of magpies” g51.

ident of the USA and Nobel Peace Prize winner, and others vigorously attacked some of Thayer’s more ludicrous examples, causing him to fall from grace. A synopsis of this chapter in the history of science was presented by the late Stephen J Gould (1941–2002) g52.

Black feathers also reduce wear, especially at the tips, as well as damage from UV radiation 3b0. The black coloration of the crow may assist in the flocking behavior of this open field feeder g39. Any crow hunter knows that placing crow decoys in a snowy field along a morning flyway will attract passing crows. Since crows often perch on



An American Crow in the shadows of an ornamental tree in **Winnipeg**, 1 August 2011

Arguments about the purpose of bird coloration are not new. An early dispute in 1896 involved the artist / naturalist Abbott Thayer. He began to promote the principle of countershading in animals. To his disadvantage, he was consumed by this idea and tried to extend his theory to embrace all the animals t31. About the crow, Thayer had this to say: “The crow’s rainbow sheens [iridescence], so little thought of as concealers, turn him into such true distant-colors as he sits on the nest, as to rank him at this moment almost with the grouse for indistinguishability.” In 1911 he published a lengthy scientific article on the “Revealing and Concealing Coloration in Birds and Mammals.” The dispute soon involved an ex-president, Teddy Roosevelt. The 26th Pres-

the uppermost bare branches of a tree, their conspicuous silhouette is highly visible to other crows of the family or flock. Crows are rarely secretive in their daily lives. When the female is incubating, the male crow perches on the edge of a tall building or atop a tree usually within 100 m of the nest to ensure he can see approaching danger and be seen by other birds. A 45 cm long, black bird is rarely cryptic.

Aside from its protective aspects, the all black color of the crow absorbs more solar energy. In a cool climate, this reduces the metabolic cost of maintaining its body temperature at about 41 °C h19. At 0 °C crows let their body temperature drop 1–2 °Celsius 48w. Should this enable the crow to extend its range further north? Pres-





Prairie Cord Grass in snow

ently, this bird resides from southern Florida into Canada where it is subjected to a temperature range of about 80 °C. This I assume, makes its black hue both a plus and a minus in maintaining its body temperature.

Certain behaviors come into play when temperatures soar. On a sunny day in Guelph, with the temperature in the mid-20s or higher, feeding crows may walk about with an open bill. When the coarse nostril tufts of feathers were removed from nine birds in Colorado, this did not significantly modify evaporation, which probably explains why crows need to open their bills to cool 48w. Sometimes shade was favored, but on other occasions they fed in the open during the warmest part of the day. Similar behavior puzzled Heppner who watched panting crows feed in the sun as the ambient temperature approached 40 °C, when shaded foraging sites were close at hand h79. At an outside temperature of 37 °C, a crow's body temperature was slightly more than 1 °C above the norm of about 41 °C. At this point, crows lose 40% of their internal heat production by evaporation 48w.

On warm days in April I've noticed incubating female crows with their bills open. I have seen a breeding crow perch on the nest's rim in May and shade its nestlings for several minutes. Occasionally, a crow will suddenly stop feeding on a sunny

lawn, open and lower its wings, tilt its head to the side, and with an open bill maintain this rigid, awkward-looking position for several seconds, perhaps as a means to reduce its body temperature. Sometimes crows spend a restful period in a shade tree on a hot afternoon. And juvenile crows, a few weeks out of the nest, may perch on a horizontal branch in the shade, face into the wind, extend their necks and raise their feathers to let the breeze fan the exposed skin. They may hold this pose for several minutes.

In a cooler climate, the adaptive value of black is perhaps more apparent. With a crow's internal fire burning at 41–42 °C, the warming of the outer feathers from the sun reduces metabolic heat loss to the colder air w63. A pair of crows on their winter territory in Guelph met the –15 °C weather with inactivity. Fluffing their feathers and facing the mid-day sun, they sat quietly in a conifer for almost two hours.

The point of these behavioral adaptations indicates the color black by itself does not appear to have limited the geographic range of the crow. The equally black Common Raven occupies an even wider range of latitude (as far as 80° N) than does the crow, suggesting that color alone would be too easy an answer to the question of northern range extension. Body size, nesting and feeding habits also play a role in a bird's distribution.





These crows were often together over 2 days, and the albino had been in the area for about 3 years. Near Montrose, **Pennsylvania**, in the north-eastern part of the state, November 2010, © Jerry Acton, with permission

Albinism

Watching crows has given me very few glimpses of white. Albinism is out there, but usually in the next county. From time to time I have observed two types of albinism. The first is an ephemeral, false kind that appears on feathers. A nocturnal addition, it happens when overwintering crows

huddled together by the thousands in trees to sleep. The birds are layered several meters deep. As you might expect, the crows below the upper ones receive a splash of white. Any large roost produces many crows with this false kind of albinism each morning. Through field glasses, the large number of feeding birds with white on their dorsal surface is at times remarkable. When the Essex flock briefly switched to a two-dimensional roosting mode, that is sleeping on the ground, no altitudinal disadvantage was imparted to any member. At once the interchangeability of their

blackness was restored. Personally, I have never experienced the crow's rite of passage, in spite of thousands of birds passing overhead as I stood watching their roosting rituals. On many a cold morning or evening, a splash of warmth in the right place would have been welcomed.

The second type of albinism is quite rare.



Ephemeral albinism Feeding in a harvested soybean field in the early morning, this American Crow was perched on a low branch at the roost which allowed it to be hit by falling shit



Color



Unlike the ephemeral type, it cannot be washed or preened away. Although thought of as congenital (present from birth), a captive crow suddenly developed white patches on its wings at five years of age w25. The Bowdoin College in Yarmouth, Maine has an unabridged albino crow's skin in its collection. It is a female with its bill, feet, claws and feathers pure white. The eyes were pink. Another entirely white crow rests quietly at Ohio State University g34. The Manitoba Museum in Winnipeg, also has a taxidermic white crow.

Partial albinism in crows is more common, but still quite rare. One roost in southern **Ontario**, which is unique for crow watching, is located in Hamilton. Here the birds assembled and often roosted along the Niagara Escarpment, a steeply treed cliff that curved through the city and beyond. From its top I had the pleasure of looking down on several thousand crows at close range. When they launched themselves from the trees, any white dorsal feathers were immediately apparent. One partial albino crow I observed for several minutes had a 3 cm wide border of creamy white along the trailing edge of its wings. When it took flight, a dozen crows flew with it calling excitedly. Ernest Good witnessed a partial albino that seemed to be persecuted by its fellows g34. The crow hunters in the United States have a site with about 25 pictures of crows with varying amounts of albinism. Visit www.crowbusters.com/oddities.htm

THE WHITE CROW

There lived in the land
Of Caw, Caw, Caw
As white a crow
As ever man saw.

And a black crow said,
One dark, wet night:
“Let’s kill the crow
With the wings of white.”

And they all said: “Yes,
Let’s kill this freak”–

Save one old raven
With a long, wise beak.

And he told them white
Was quite the thing:
So they made the white crow
Caw-Caw’s king.

– Wilson MacDonald 1930 m06

Gross reported 304 albinistic species (1,847 birds) in 54 of the 75 families of birds in North America. The American Robin (8%) and House Sparrow (6%) lead the pack for incidence of albinism. Eleven of the 18 species of Corvidae (116 birds) in North America are distinguished by their occasional whiteness 976.

Partial albinos come in a few designs, with parts of their wings and tail displaying an absence of melanins. From crows in **Saskatchewan** and **Maryland**, Nero described a white pattern on the inner areas of primaries and secondaries, some upper coverts and the tail n17. Two crows in



A rare caramel-colored juvenile crow begging at a birdbath from presumable one of its parents, 13 July 2009, © Kate and Felipe Garcia from Oak Harbor, Whidbey Island, **Washington**, USA. Perhaps it is a Northwestern Crow. No contact possible so I copied and cropped it without permission from <http://crows.net/images/brownrcrow2.jpg>





Primary wing feathers of a partial albino American Crow from the Manitoba Museum, **Winnipeg**

Maryland flew together until one was shot. Both of its wings had white markings on the inner vane of most of the primaries and secondaries ^{s74}. Usually the white flag of color reversal is visible only in flight, as Sealy observed in a wing-barred crow near Battleford **Saskatchewan**. Possibly a diet lacking the amino acid lysine, a constituent of most proteins, contributes to the appearance of white feathers ^{s48}.

An unusual pattern of white plumage (pied or calico) decorated an American Crow donated to the New York State Museum in Albany (catalogue # 5255). Its wing chord was 29.2 cm and its tarsus 5.1 cm. The white pattern on the right wing was different from that on the left wing ^{68s}. On 27 August 1975, a different crow was among 50 feeding near Highway 1 about 0.8 km north of Olema **California**. The two outer primaries on both of its wings were white; either marked or a partial albino. There was no aggression involving this crow ^{l29}.

In Cherry Hill **New Jersey**, an incomplete albino crow was first seen in a cemetery and thereafter in the area for several years. Then, two

other crows with “bilaterally complete white secondaries and normal black coloration elsewhere” were observed. “Melanin pigmentation is hormonally controlled, notably by the thyroid gland. The depth of color is governed genetically and by such factors as humidity and diet. Albinism, the absence of pigment, is associated with a genetic recessive trait which inhibits the formation of the enzyme tyrosinase, responsible for melanin synthesis.” White feathers on a dark or black bird may also be due to shock, poor diet or even old age ^{74h}.

The fate of full and partial albinos is unknown for American Crows. But in **Japan**, Kuroda and Kazama followed an unmarked breeding pair of Carrion Crows for 8 years in the 1990s. One of the pair was normal, the other sported a buff-colored topcoat. The pair produced an estimated 32 nestlings, including 9 albinos and one with “white on the vanes of its primaries and secondaries.” Albino fledglings and adults were noted in a few other locations ^{21k}.

One juvenile crow in **Guelph** that fed with a family of six was a partial albino. As it explored





with a sibling in early July, I had the impression it was dominated by its larger, all-black peers. If it survived to reach sexual maturity at two or more years of age, would it be able to hold a territory and mate? North of **Toronto** on 29 June 1908, Fleming and Lloyd described two albino nestlings from one nest as grayish white with a beak the color of a mammal's horn. Their feet were lead-black and eyes a bluish gray f42.

The crow with the rarest color is an erythristic (reddish) one. One was killed in 1939, which became part of the collection of Ohio State University. Most of the feathers were a warm brown, and the beak, eyes and feet were a dark brown when collected g34. If you visit **crows.net**, in the long list of marvelous anecdotes are a few pictures of white and caramel colored crows submitted by the public; one of which I display on **page 37**. Piers described a partial albino, which was a caramel-

colored crow, near Halifax **Nova Scotia** in the late 1890s. His description – “Its general colour was brown, darker on the throat, cheeks and belly; scapulars and feathers of back margined obscurely with whitish; primaries mostly whitish; tertials white; tail-feathers light reddish brown margined with whitish on outer edge; legs, bill and iris, brown” p62.

According to mythology, the crow and raven were once white. After the legendary fall, however, their color quickly darkened to match their “obvious” dark character. A few of their nasty habits did nothing to endear them to us. The French believed bad priests became ravens and bad nuns, crows. Others believed crows went down to hell in mid-summer and gave the devil an offering of their feathers. Amen ■

